

AMENDMENTS

In the Claims:

Please **cancel** Claims 40, 67, and 78

Please **amend** Claims 5, 12, 16, 26, 28, 30-34, 41, 57-58, 61, and 68-71 by substitution as follows:

5. (Twice amended) A method of generating a tone waveform based on performance information, using a processor device executing a plurality of different programs on a time division basis, said method including executing a waveform calculating process for calculating tone waveform samples on the basis of one of the programs by sharing the processor device with another process based on another one of the programs, the waveform calculating process being executed per predetermined constant period so as to collectively generate a plurality of tone waveform samples per execution of the waveform calculating process, said method comprising the steps of:

detecting an amount of calculation time necessary for the other process, when the waveform calculating process is to be executed; and

calculating tone waveform samples by selectively executing the waveform calculating process that involves a variable calculation amount which depends on said amount of calculation time necessary for the other process detected by said step of detecting.

12. (Twice amended) A machine-readable recording medium containing a group of instructions to cause said machine to generate a tone waveform based on performance information by executing a waveform calculating process for calculating tone waveform samples by using a processor device, the processor device also executing another process in response to a different group of instructions, the waveform calculating process being executed per predetermined constant period so as to collectively generate a plurality of tone waveform samples per execution of the waveform calculating process, said group of instructions executable by said processor device to perform a method comprising the steps of:

instructing the machine to detect an amount of calculation time necessary for the other process, when the waveform calculating process is to be executed;

instructing the machine to calculate tone waveform samples by selectively executing the waveform calculating process that involves a variable calculation amount that depends on said detected amount of calculation time necessary for the other process; and

instructing the machine to generate a tone waveform based on the calculated tone waveform samples.

16. (Twice amended) A computer system for generating a tone waveform based on performance information, said computer system comprising:

a memory device that stores a plurality of programs; and

a processor device that executes a waveform generating process including a waveform calculating process for calculating tone waveform samples based on a predetermined one of said programs and one or more other processes based on other of said programs in a parallel manner on a time-division basis, the waveform calculating process being executed per predetermined constant period so as to collectively generate a plurality of tone waveform samples per execution of the waveform calculating process,

wherein said predetermined one of said programs includes the steps of:

detecting an amount of calculation time necessary for said other process, when the waveform calculating process is to be executed; and

calculating tone waveform samples by selectively executing the waveform calculating process that involves a variable calculation amount which depends on said amount of calculation time necessary for said other process detected by said step of detecting.

26. (Twice amended) A tone waveform synthesizing apparatus comprising:

a storage adapted to temporarily store a plurality of tone waveform samples, said storage permitting the writing and reading, independently of each other, in a parallel fashion, said storage further storing a waveform forming program; and

a processor coupled to said storage and adapted to collectively generate a plurality of tone waveform samples in advance of predetermined reproduction timing, by executing the waveform forming program stored in said storage, said processor adapted to control writing of the generated tone waveform samples into said storage and reading out the tone waveform samples from said storage at said reproduction timing, the writing and reading into and from said storage being controlled independently of each other and also in such a manner that an advance of the writing does not outpace an advance of the reading.

28. (Amended) A method of generating a tone waveform, said method comprising the steps of:

collectively generating a plurality of tone waveform samples in advance of predetermined reproduction timing, by a processor executing a waveform forming program;

writing, into a storage, the plurality of tone waveform samples produced by said generating step, said storage being capable of writing and reading, independently of each other, in a parallel fashion;

reading out the stored tone waveform samples from said storage at said reproduction timing; and

controlling writing and reading into and from said storage by said steps of writing and reading independently of each other and also in such manner that an advance of the writing does not outpace an advance of the reading.

30. (Amended) A method of generating a tone waveform based on performance information, using a processor executing a tone waveform forming program stored in a storage, said method comprising the steps of:

receiving automatic performance information;

receiving real-time performance information generated in response to a real-time performance operation;

generating tone waveform samples using said processor, said step of generating including a step of collectively generating a plurality of tone waveform samples in advance of predetermined reproduction timing on the basis of the received automatic performance information and a step of collectively generating a plurality of tone waveform samples in advance of predetermined reproduction timing on the basis of the received real-time performance information, said step of generating being capable of generating the tone waveform samples based on the automatic performance information and the tone waveform samples based on the real-time performance information in a parallel fashion; and

outputting the tone waveform samples generated by said step of generating.

31. (Amended) A method as recited in claim 30 wherein said step of outputting further includes a step of mixing the tone waveform samples based on the automatic performance information and the tone waveform samples based on the real-time performance information to thereby provide mixtures of the samples, each of the mixtures being composed of the tone waveform samples to be reproduced at a same reproduction timing, and a step of writing the mixtures into an output buffer.

32. (Amended) A method as recited in claim 30 wherein said step of generating further comprises the step of performing arithmetic operations for generating the tone waveform samples based on the automatic performance information and the tone waveform samples based on the real-time performance information, independently of each other, in such a manner that an advance of the arithmetic operations for the tone waveform samples based on the automatic performance information and an advance of the arithmetic operations for the tone waveform samples based on the real-time performance information differ from each other.

33. (Amended) A method as recited in claim 32 wherein said step of generating further comprises the step of advancing arithmetic operations for the tone waveform samples based on the automatic performance information within an extent of an available processing capability taking into account a current processing capability of said processor.

34. (Amended) A method of generating a tone waveform using a processor capable of executing a plurality of different programs on a time divisional basis, said method comprising the steps of:

supplying said processor with application software including at least an image control program for controlling image display, a music control program for controlling tone generation, and a general control program, said music control program including tone color data;

causing said processor to execute, under control by the general control program, the image control program and the music control program in a parallel fashion, to output image data generated as a result of execution of the image control program and tone waveform data generated as a result of execution of the music control program;

detecting an available time portion in which said processor is not currently used for any other process than a tone waveform generating process, as an available processing capability for the tone waveform generating process; and

causing said processor to execute the tone waveform generating process based on the music control program, using the available processing capability detected by said step of detecting.

41. A machine-readable medium for use in an apparatus having a processor, said medium including instructions executable by said processor for causing said apparatus to perform a method of generating a tone waveform, said method comprising the steps of:

collectively generating a plurality of tone waveform samples in advance of predetermined reproduction timing;

writing, into a storage, the plurality of tone waveform samples produced by said generating step, said storage being capable of writing and reading, independently of each other, in a parallel fashion;

reading out the stored tone waveform samples from said storage at said reproduction timing; and

controlling writing and reading into and from said storage by said steps of writing and reading independently of each other and also in such a manner that an advance of the writing does not outpace an advance of the reading.

57. (Amended) A machine-readable medium for use in an apparatus having a processor, said medium including instructions executable by said processor for causing said apparatus to perform a method of generating a tone waveform based on performance information, said method comprising the steps of:

receiving automatic performance information;

receiving real-time performance information generated in response to a real-time performance operation;

generating tone waveform samples using said processor, said step of generating including a step of collectively generating a plurality of toe waveform samples in advance of predetermined reproduction timing on the basis of the received automatic performance information and a step of collectively generating a plurality of tone waveform samples in advance of predetermined reproduction timing on the basis of the received real-time performance information, said step of generating being capable of generating the tone waveform samples based on the automatic performance information and the tone waveform samples based on the real-time performance information in a parallel fashion; and

outputting the tone waveform samples generated by said step of generating.

58. (Amended) A medium as recited in claim 57 wherein said step of outputting further includes a step of mixing the tone waveform samples based on the automatic performance information and the tone waveform samples based on the real-time performance information to thereby provide mixtures of the samples, each of the mixtures being composed of the tone waveform samples to be reproduced at a same reproduction timing, and a step of writing the mixtures into an output buffer.

61. (Amended) A machine-readable medium for use in an apparatus having a processor, said medium including instructions executable by said processor for causing said apparatus to perform a method of generating a tone waveform by executing a plurality of different programs on the time divisional basis, said method comprising the step of:

supplying said processor with application software including at least an image control program for controlling image display, a music control program for controlling tone generation, and a general control program, said music control program including tone color data;

causing said processor to execute, under control by the general control program, the image control program and the music control program in a parallel fashion, to output image data generated as a result of execution of the image control program and tone waveform data generated as a result of execution of the music control program;

detecting an available time portion in which said processor is not currently used for any other process than a tone waveform generating process, as an available processing capability for the tone waveform generating process; and

causing said processor to execute the tone waveform generating process based on the music control program, using the available processing capability detected by said step of detecting.

68. (Amended) A tone waveform generating apparatus comprising:
storage adapted to receive automatic performance information and to receive real-time
performance information generated in response to a real-time performance operation; and
a processor coupled to said storage and adapted to execute a tone waveform forming
program stored in said storage, said processor generating tone waveform samples by collectively
generating a plurality of tone waveform samples in advance of predetermined reproduction
timing on the basis of the automatic performance information and by collectively generating a
plurality of tone waveform samples in advance of predetermined reproduction timing on the
basis of the real-time performance information, said processor further generating the tone
waveform samples based on the automatic performance information and the tone waveform
samples based on the real-time performance information in a parallel fashion and outputting the
generated tone waveform samples.

69. (Amended) An apparatus as recited in claim 68 wherein said processor further
mixes the tone waveform samples based on the automatic performance information and the tone
waveform samples based on the real-time performance information to thereby provide mixtures
of the samples, each of the mixtures being composed of the tone waveform samples to be
reproduced at a same reproduction timing, said processor further writing the mixtures into an
output buffer.

70. An apparatus as recited in claim 68 wherein said processor further performs arithmetic operations to generate the tone waveform samples based on the automatic performance information and the tone waveform samples based on the real-time performance information, independently of each other, in such a manner that an advance of the arithmetic operations for the tone waveform samples based on the automatic performance information and an advance of the arithmetic operations for the tone waveform samples based on the real-time performance information differ from each other.

71. (Amended) An apparatus as recited in claim 70 wherein said processor further advances arithmetic operations for the tone waveform samples based on the automatic performance information within an extent of an available processing capability taking into account a current processing capability of said processor.

72. (Amended) A tone waveform generating apparatus comprising:

storage adapted to store application software including at least an image control program for controlling image display, a music control program for controlling tone generation, and a general control program, said music control program including tone color data;

a processor coupled to said storage and adapted to generate a tone waveform by executing a plurality of different programs on a time divisional basis, said processor adapted to execute, under control by the general control program, the image control program and the music control program in a parallel fashion, to output image data generated as a result of execution of the image control program and tone waveform data generated as a result of execution of the music control program; and

detecting an available time portion in which said processor is not currently used for any other process than a tone waveform generating process, as an available processing capability for the tone waveform generating process; and

causing said processor to execute the tone waveform generating process based on the music control program, using the available processing capability detected by said step of detecting.